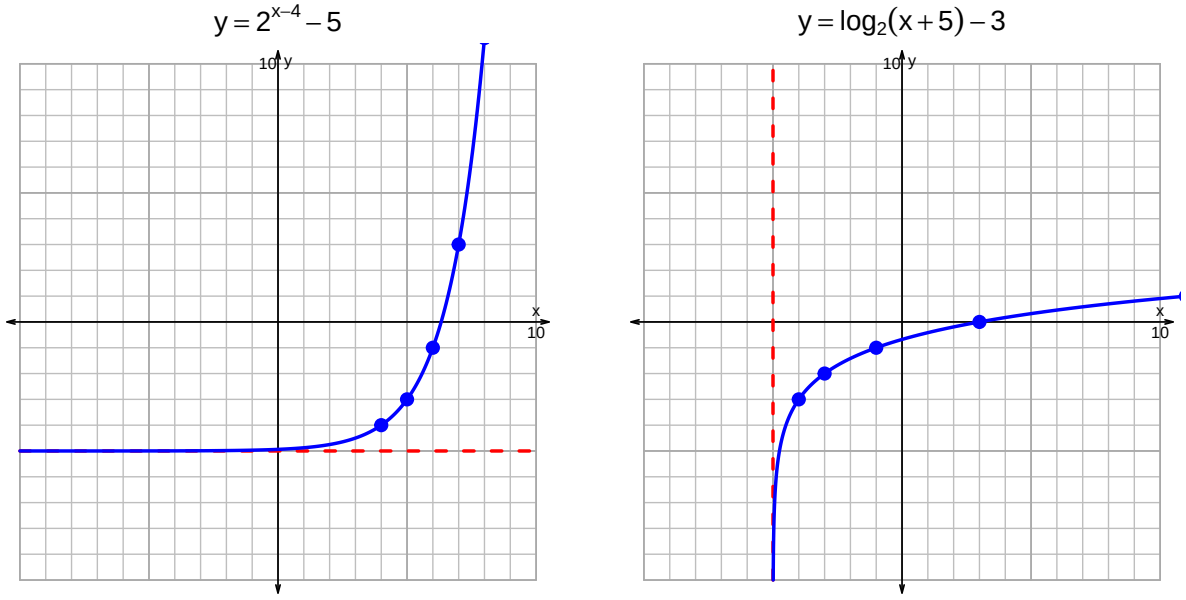
Name: Date:

s18quiz: EXP LOG (Solution v111)

1. Graph $y = 2^{x-4} - 5$ and $y = \log_2(x+5) - 3$ on the grids below. Also, draw any asymptotes with dotted lines.



2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$29 = \left(\frac{4}{3}\right) \cdot 10^{5t/7}$$

Divide both sides by $\frac{4}{3}$.

$$\frac{29 \cdot 3}{4} = 10^{5t/7}$$

Take log, base 10, of both sides.

$$\log_{10}\left(\frac{29 \cdot 3}{4}\right) = \frac{5t}{7}$$

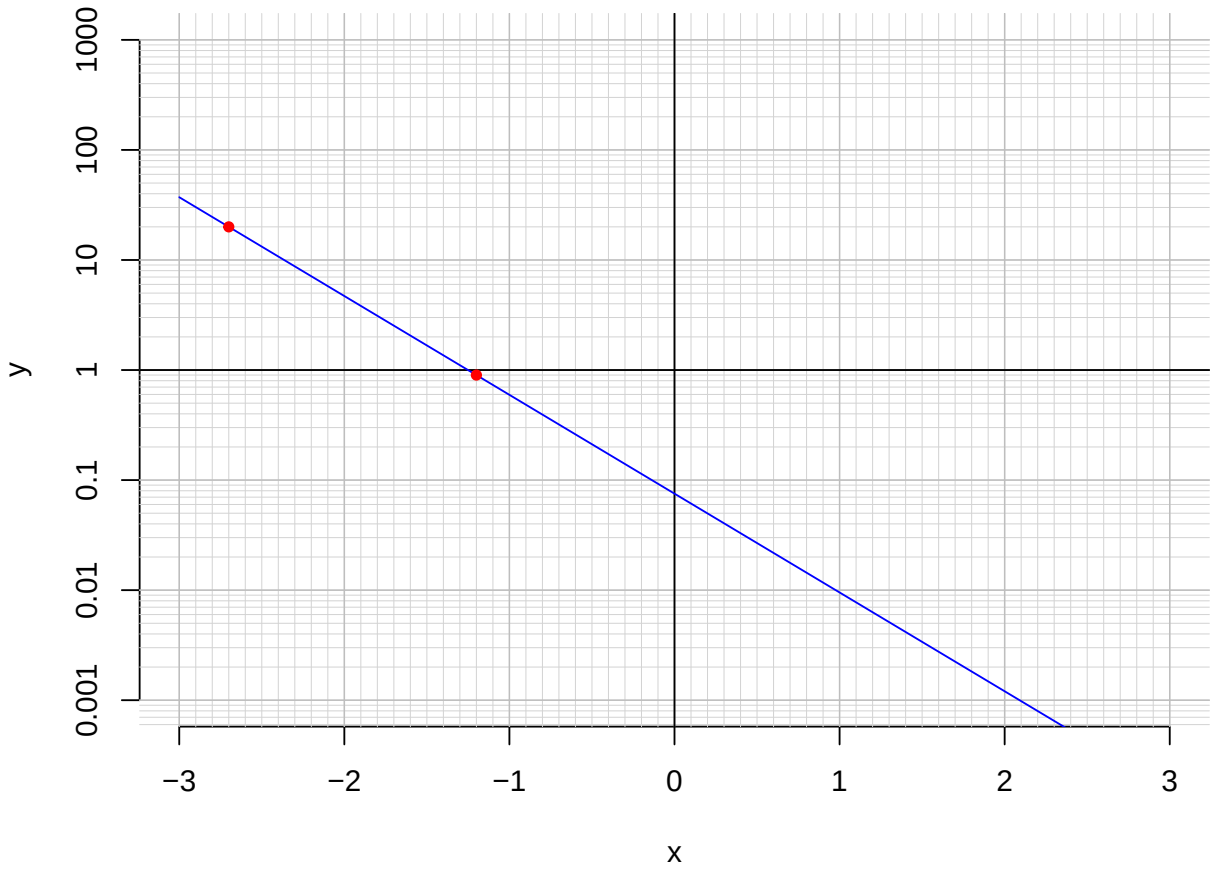
Divide both sides by $\frac{5}{7}$.

$$\frac{7}{5} \cdot \log_{10}\left(\frac{29 \cdot 3}{4}\right) = t$$

Switch sides.

$$t = \frac{7}{5} \cdot \log_{10}\left(\frac{29 \cdot 3}{4}\right)$$

3. An exponential function $f(x) = 0.0753 \cdot e^{-2.07x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(-1.2)$.

$$f(-1.2) = 0.9$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{2.07} \cdot \ln\left(\frac{x}{0.0753}\right)$$

c. Using the plot above, evaluate $f^{-1}(20)$.

$$f^{-1}(20) = -2.7$$